The Environmental Water Account and Wintering Waterbirds: Using Predictive Modeling and Monitoring in an Adaptive Management Process to Improve CALFED Implementation for Greater Sandhill Cranes, Waterfowl, and Shorebirds

Joseph P Fleskes

Public Comments

No public comments were received for this proposal.

Technical Synthesis Panel Review

Proposal Title

#0204: The Environmental Water Account and Wintering Waterbirds: Using Predictive Modeling and Monitoring in an Adaptive Management Process to Improve CALFED Implementation for Greater Sandhill Cranes, Waterfowl, and Shorebirds

Final Panel Rating
inadequate

Technical Synthesis Panel (Primary) Review

TSP Primary Reviewer's Evaluation Summary And Rating:

The proposed investigation will 1) estimate Greater Sandhill Crane habitat use and movement relative to the Environmental Water Account (EWA), 2) model impacts of EWA scenarios on waterbird ecology, and 3) monitor the effects of EWA on Northern Pintails. The authors assume that the implementation of the EWA might influence habitat quality of cranes and other waterbirds, but do not make any predictions on whether effects will be positive or negative. Overall, the goals and objectives are clear. Furthermore, some parts of the proposed work take advantage of previous monitoring to interpret pre−implementation of EWA relative to post−implementation of the EWA. Although the authors do not provide a detailed conceptual model or hypotheses to be tested, the issue is important and very timely. The proposal is divided into four distinct tasks, each of which provides very different information in relation to waterbirds and the EWA. Task 1 is general project management. Task 2 determines sandhill crane habitat use by radio−tracking 30 cranes during the non−breeding season and also conducting aerial and ground surveys. Overall, the approach to this task is well−defined. However, radios will be deployed non−randomly by primarily targeting birds on National Wildlife Refuges and State

Wildlife Areas. As one reviewer noted, “I wonder if the trapping of Cranes primarily from protected areas will yield data that are statistically representative of the "universe of interest" –i.e., all cranes in the area, including those using solely private land”. It is unclear if this information will be used in Task 3 (modeling), but if it is, it could provide biased estimates of habitat associations used for modeling the impacts of EWA scenarios. It is also unclear how aerial sampling will occur and how the authors will test their “statistically valid sampling strategy”. In Task 3, the investigators will model impacts of EWA scenarios on waterbird ecology. This task, while very important, was not clearly described. Both reviewers noted that the simulation models were not outlined well, and although there was some mention of the statistical approach, it was unclear what factors would be included in the modeling attempts and how the investigators expect EWA should impact waterbirds. In Task 4, the investigators will radio−mark 40 Northern Pintails and conduct aerial surveys of waterbirds using similar methods to previous investigations (by one of the PIs). By doing so, they can compare pre− and post−implementation of the EWA. While this is potentially a strong component of the proposal, it is unclear how specifically this information will be integrated to understand how the EWA influences waterbirds. Furthermore, including a control treatment (not EWA−influenced) to monitor the post−implementation of EWA would enhance the design, because as designed, EWA−influenced effects will be confounded with year effects. This is particularly important because the investigators only plan for radio−tracking pintails and conducting aerial surveys over one winter. Another concern raised by a reviewer regarding Task 4 is that the post−implementation data hinge on a timely initiation of the EWA; if this is not implemented on schedule, it could influence the likelihood of success. Overall, reviewers agreed that the capabilities of the research team are generally strong for the proposed investigation. The feasibility of the project is generally high, except that Task 3 is undeveloped conceptually and Task 4 is dependent on proper implementation of the EWA. Both reviewers commented that the budget seemed high, particularly when noting that radio−tracking of cranes and pintails will each only occur for one year. The potential

products are difficult to interpret; peer−reviewed articles might be generated for some tasks (Task 4), but not others (e.g., Task 2).

Additional Comments:

The investigators noted that this proposal could be treated as potentially separate projects that could be funded. Task 4 has the strongest value because it uses previously collected (and published) data to compare habitat use before and after EWA implementation. I would rate Task 4 as above average.

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biased estimates of habitat associations used for modeling the impacts of EWA scenarios. It is also unclear how aerial sampling will occur and how the authors will test their "statistically valid sampling strategy". In Task 3, the investigators will model impacts of EWA scenarios on waterbird ecology. This task, while very important, was not clearly described. Both reviewers noted that the simulation models were not outlined well, and although there was some mention of the statistical approach, it was unclear what factors would be included in the modeling attempts and how the investigators expect EWA should impact waterbirds. In Task 4, the investigators will radio-mark 40 Northern Pintails and conduct aerial surveys of waterbirds using similar methods to previous investigations (by one of the PIs). By doing so, they can compare pre- and post-implementation of the EWA. While this is potentially a strong component of the proposal, it is unclear how specifically this information will be integrated to understand how the EWA influences waterbirds. Furthermore, including a control treatment (not EWA-influenced) to monitor the post-implementation of EWA would enhance the design, because as designed, EWA-influenced effects will be confounded with year effects. This is particularly important because the investigators only plan for radio-tracking pintails and conducting aerial surveys over one winter. Another concern raised by a reviewer regarding Task 4 is that the post-implementation data hinge on a timely initiation of the EWA; if this is not implemented on schedule, it could influence the likelihood of success. Overall, reviewers agreed that the capabilities of the research team are generally strong for the proposed investigation. The feasibility of the project is generally high, except that Task 3 is undeveloped conceptually and Task 4 is dependent on proper implementation of the EWA. Both reviewers commented that the budget seemed high, particularly when noting that radio-tracking of cranes and pintails will each only occur for one year. The potential products are difficult to interpret; peer-reviewed articles might be generated for some tasks (Task 4), but not others (e.g., Task 2).

Technical Synthesis Panel (Discussion) Review

TSP Observations, Findings And Recommendations:

The Environmental Water Accoun (EWA) and Wintering Waterbirds: Using Predictive Modeling and Monitoring in an Adaptive Management Process to Improve CALFED Implementation for Greater Sandhill Cranes, Waterfowl, and Shorebirds

This study has three distinct objectives: measure GSHC habitat use, model EWA impacts, and EWA impacts on pintails.

Reviewers felt that the objectives were not hypothesis driven. Reviewers wondered whether just sampling cranes from protected areas would result in a representative sample. The panel also felt that the manner in which the impacts of the EWA would be modeled was not adequately described. Reviewers would like to see more detail on the modeling.

The panel felt that the description of the pintail study was relatively vague, but an important part of the study. The reviewers felt that the sample size was too small and sampling of pintail too short. Implementation of the study hinges on EWA being implemented in a timely manner. Investigators were considered qualified by the reviewers.

The reviewers had serious concerns that statistical approaches were not identified. One of the reviewers felt that the researchers should put all effort into the study that was comparing conditions before and after EWA.

Rating: inadequate

Technical Review #1

proposal title: The Environmental Water Account and Wintering Waterbirds: Using Predictive Modeling and Monitoring in an Adaptive Management Process to Improve CALFED Implementation for Greater Sandhill Cranes, Waterfowl, and Shorebirds

Review Form

Goals

Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea timely and important?

Comments	**The goals and objectives are clearly stated. No hypotheses are explicitly stated, nor do they need to be for a project of this kind. The idea is both timely and important. The proposal is conceptually strong, but lacking in important details, especially for the approach of Task 3 (model building).**
Rating	**good**

Justification

Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full−scale implementation project justified?

Comments	**The authors are to be commended for developing a strong and clearly articulated justification for their work. The work is timely and a post−implementation evaluation of the effects of EWA is a critical component of the EWA process.**
Rating	**very good**

Approach

Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology, or approaches? Will the information ultimately be useful to decision makers?

Comments	**Aside from web site maintenance, it is not clear what specific activities are included in Task 1. Because a similar web site already exists (http://www.werc.usgs.gov/pinsat/), it would seem that some of the development costs of the web site already have been incurred and that someone also currently is paying for web site maintenance.** **The approach and methods to be used to meet the objectives of Task 2 are clear and described well. I would rate the approach of Task 2 as "Very Good." However, the information provided related to the approach proposed for Task 3 is not sufficient to allow adequate evaluation.** **For Task 3, the authors describe the application of AIC to choose the most parsimonious model from an array of models that are not specified or described adequately in the proposal. The authors do not specify the parameters that will be used in their models, nor do they identify clearly what measures will be taken in the field or derived using GIS and remotely−sensed imagery to estimate those parameters.** **No procedures are described for validating the most parsimonious model once it is identified. While lower AIC scores may help to identify the most parsimonious model from an array of alternative models, the model with the lowest AIC score may not necessarily**

	have high predictive abilities. As presented in this proposal, I rate the approach for Task 3 as "Poor." For Task 4, it is not clear what additional, essential information that is critical for evaluating the effects of implementing EWA will result from radio telemetry of Northern Pintails. I rate the approach of Task 4 as "Fair."
Rating	fair

Feasibility

Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives and within the grasp of authors?

Comments	See comments above under "Approach." The approach of Task 3 is insufficiently documented. The need and justification for including radio−tracking of Northern Pintails as part of Task 4 is not explained.
Rating	fair

Monitoring

If applicable, is monitoring appropriately designed (pre−post comparisons; treatment−control comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Comments	See comments under "Approach" (above) for Task 4. Pre−treatment data already exist and post−treatment sampling, during one season, is proposed, where the treatment is implementation of EWA. It is not clear what kinds of information that is critical for decision−making will be obtained from radio−tracking of Northern Pintails during the post−treatment sampling of waterfowl, crane, and shorebird population numbers and dispersion.
Rating	

	good

Products

Are products of value likely from the project? Are contributions to larger data management systems relevant and considered? Are interpretive (or interpretable) outcomes likely from the project?

Comments	**The products proposed are of the kind conventionally expected from a project of this type. However, greater elaboration of the "outreach" component mentioned by the authors would be helpful.** **The work described in this proposal is a "natural" for a relatively high-profile, coordinated, and professionally managed outreach effort. The outreach component needs to be described in greater detail. It is not clear what materials will be provided and how the anticipated audience(s) are characterized (birdwatchers, farmers, public school teachers and students, or others?). How many individuals in what stakeholder groups are expected to be reached over what period of time? If cranes make significant use of privately owned agricultural lands, farmers are a significant stakeholder group. Is an outreach component aimed specifically at farmers contemplated? Is involvement of USDA/Natural Resources Conservation Service a reasonable consideration? A method for assessing the effectiveness of the outreach component is not proposed. A plan for evaluation of the proposed outreach activities should be included.**
Rating	**fair**

Additional Comments

Comments	**Delivery of information over the Intenet using a web site is proposed. The Senior PI (Fleskes) already has a web site describing his satellite telemetry work**

	with Northern Pintail (http://www.werc.usgs.gov/pinsat/). Use of a similar approach for this project has potential, but the web site should be more user-friendly and graphically creative than the existing web site. Use of alternative software, such as Manifold (http://www.manifold.net/), could make web-based delivery of information more interesting, cost-effective, and easier to implement. Manifold is inexpensive and especially well suited for web-based delivery and display of spatially referenced information derived from use of GIS.

Capabilities

What is the track record of authors in terms of past performance? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Comments	**Staff appear to be strong and experienced in all areas except outreach and extension. See related comments above. Consideration should be given to adding an outreach specialist to the team or input solicited from a professional outreach/public education/extension specialist.**
Rating	**very good**

Budget

Is the budget reasonable and adequate for the work proposed?

Comments	**My greatest concern with this proposal is the high cost of the project. In particular, the costs of Task 1, Project Adminstration, seem rather high, given that salary recovery for staff included in Task 1 also is proposed for subsequent tasks.** **Why are costs of salaries and fringes for USGS/WERC Staff included in the budget? Are these staff not permanent USGS/WERC employees with salaries and**

fringes already covered by USGS/BRD?

From the USGS/WERC Mission Statement at http://www.werc.usgs.gov/mission.html, I found the following:

“The most valuable resource of the Center is its dedicated staff. Their integrity and professionalism are the foundation for the Center's success. They work in an environment that encourages teamwork, growth, and problem solving. Center staff are accessible and responsive to all persons, groups, or organizations that request ecological information. Center scientists provide objective information on natural resources issues.” “The Center was created and operates under the principle of decentralized streamlined government. The Center maintains a small headquarters on the campus of California State University at Sacramento. The structure of the Center is designed for fluid, high quality scientific response to priority resource issues throughout the Pacific Southwest. The Center's field stations, located in all major Pacific Southwest bioregions, form the core of its science program. Center stations were founded on the principle of client service, and the Center's research, inventory and monitoring, and information transfer agenda is shaped by client needs. Center scientists actively seek client input and participation at all phases of research projects.”

Nowhere in the Center’s mission statement does it say that clients will be charged fees for the services the Center can provide. A clear and explicit explanation of the rationale for charging the costs of USGS/WERC permanent staff salaries and fringes needs to be included in the budget justification narrative.

Likewise, a clear rationale for charging salary costs for a Professor at Oregon State University should be included. Typically, university professors engage in research as part of their jobs, unless the professor

	is working under the terms of a nine-month appointment. While it is customary to seek external funding for graduate student stipends, as is the case here, professorial salaries usually are covered by the university.
Rating	**poor**

Overall

Provide a brief explanation of your summary rating.

Comments	**While the work proposed here is important and essential for evaluating the effects of implementation of EWA, the costs are very high. The authors have not given sufficient justification for the high costs. The procedural details for critical components of the project within Task 3 are insufficient to permit in-depth evaluation of their appropriateness for this project.**
Rating	**fair**

Technical Review #2

proposal title: The Environmental Water Account and Wintering Waterbirds: Using Predictive Modeling and Monitoring in an Adaptive Management Process to Improve CALFED Implementation for Greater Sandhill Cranes, Waterfowl, and Shorebirds

Review Form

Goals

Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea timely and important?

Comments	**Goals and objectives are clear, well delinated, and partitioned among the 4 tasks described. The idea is very timely -- before/after implementation of Environemtnal Water Account (EWA). The issue is important from the perspective of understanding impacts of EWA on wildlife, especially the at-risk Greater Sandhill Crane.** **Hypotheses are not clearly indentified. Instead, the "approach and scope of work" section outlines the objectives and methods to achieve them. The science of this project would be better clarified, and slightly improved, by a more careful and explicit articualtion of hypotheses, and logical predictions deduced from them,.**
Rating	**very good**

Justification

Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

Comments	**Justification is strong and well-aligned with CALFED goals and objectives. The opportunity for before/after**

	data on the wildlife-related impacts of EWA is very attractive. However, the after data of course hinge on the timely initiation of the EWA mid-way through the worked proposed in this project. I don't know how certain this timing is. If CALFED wishes to guard against funding a proposal hinging on the implementation of EWA, the award could be such that funds for tasks 1 and 2 are provided now, and funds for tasks 3 &4 could be requested at a later date once the implementation of EWA is made more certain. (If the timely implemenation IS certain, then this comment is moot).
Rating	**very good**

Approach

Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology, or approaches? Will the information ultimately be useful to decision makers?

Comments	**The approach appears strong. Sufficent detail on data collection is provided, and in places analytical details are also made explicit (e.g., use of information theoretic approach &AIC values). However, in other critical areas (habitat selection analysis, GIS modeling), the proposal lacks enough detail to demonstrate the work will be completed with sufficient rigor. The PIs are highly qualified, but state-of-the-art analyses are frequently changing, and they should better show that the most rigorous, advanced approaches can and will be used. The modeling statistician is un-named in this proposal, and he/she will play a key role in not only the future analyses (Task 3), but he/she should also be involved in the design of data collection (Task 2). So I would prefer if the PIs either identified this person and sought their input on the design, or articualted to reviewers the design properties of the habitat selection &GIS modeling. For example, there is no reference to**

	Resource Selection Functions, Compositional Anlyses, Euclidian distance analyses, etc. Looking into a couple of Fleskes' publications, I see he is proficient in some of these apparoaches (e.g., Compositional Analyses), but recent papers call some of these tools into question, and the authors should show more clearly show they will have (and/or obtain via personnel) the expertise to ensure a rigorous design &modeling analysis. **Also, I wonder if the trapping of Cranes primarily from protected areas (wildlife refuges and state wildlife areas) will yield data that are statistically representative of the "universe of interest" –– i.e., all cranes in the area, including those using solely private land.**
Rating	**fair**

Feasibility

Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives and within the grasp of authors?

Comments	**The feasibility appears very good. The PIs have shown sucess with this type of work before; the budget and narrative suggest they know what it takes to complete the work. The field procedures have all been proven previously, often by the PIs and other personnel themsleves.**
Rating	**excellent**

Monitoring

If applicable, is monitoring appropriately designed (pre−post comparisons; treatment−control comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Comments	**Pre−post design is good. Having a control treatment (not EWA−influenced) to monitor after**

	EWA-implementation would enhance the design (a true BACI design in that case), but may not be feasible. As designed, EWA-influenced effects will be confounded with year effects. This may not be a critical weakness, but the PIs should discuss the likelihood of whether it could be, and/or the feasibility (or lack thereof) of a true BACI design.
Rating	**good**

Products

Are products of value likely from the project? Are contributions to larger data management systems relevant and considered? Are interpretive (or interpretable) outcomes likely from the project?

Comments	**Products and deliverable, dessimination, etc. appear appropriate to me.**
Rating	**very good**

Additional Comments

Comments

Capabilities

What is the track record of authors in terms of past performance? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Comments	**See Feasibility comments above. The PIs appear well qualified for most of the work (and perhaps all of it), but I would have preferred to see better demonstration of command of modeling/GIS design issues (via their own expertise of that of the hired modeler).**
Rating	**good**

Budget

Is the budget reasonable and adequate for the work proposed?

Comments	**Appears reasonable to me.**
Rating	**excellent**

Overall

Provide a brief explanation of your summary rating.

Comments	**The proposal is important and well justified, clearly linked to CALFED's abjectives, and likely to succeed. The only major concern I have is in the design of statistical modeling of the habitat selection by wildlife and modeled predicted outcomes post EWA-implementation.**
Rating	**good**